

### Abstract

#### Reducing Oxides of Nitrogen Using Reformate Generated from Engine Fuel, Water and/or Air

Inlet air (15) humidified in an air bubbling (or other) humidifier (35) that receives water from a tank (36) is sent to a hydrogen generator (27) along with vaporized (23) diesel fuel (22) to produce hydrogen and carbon monoxide (28) for either (a) mixing with the mainstream of exhaust (18) fed to a catalytic converter (30) or (b) regenerating a pair of NO<sub>x</sub> adsorption traps (38, 39), thereby reducing oxides of nitrogen (NO<sub>x</sub>), to provide system exhaust (32) which may have less than 0.40 grams/bhp/hr of NO<sub>x</sub> and 0.28 grams/bhp/hr of non-methane hydrocarbons. In other embodiments, unhumidified air mixed with fuel feeds a homogeneous non-catalytic partial oxidizer (27) to provide the required hydrogen and carbon monoxide.